Water Quality Watch

Chesterfield County Riparian Buffer Monitoring Guide

CHESTERFIELD COUNTY
1749
VIRGINIA

Chesapeke Bay Preservation Act
Resource Protection Areas

Background

In 1989, the Virginia General Assembly adopted the Chesapeake Bay Preservation Act. The purpose of that law is to "protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters by minimizing the effects of human activity upon these waters." In Chesterfield County there are approximately 1,300 miles of perennial and intermittent streams and approximately 95 miles of riverfront along the James and Appomattox Rivers. All of these waters are important resources to the citizens of Chesterfield and drain to the Chesapeake Bay. The county adopted a local ordinance to carry out the requirements of the Bay Act in 1991.

A key component of the Chesapeake Bay Preservation Act and its regulations is the identification of "lands adjacent to water bodies with perennial flow that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts that may result in significant degradation to the quality of state waters." Such lands are known as Resource Protection Areas or RPAs. They are also generally referred to as riparian buffers.

If you live near one of these areas that has been left in its natural state, you may notice that there are several layers of vegetation. Typically, an undisturbed RPA contains a dense tree canopy, understory trees, shrubs and leaf or pine litter. Similar to the various parts of an engine, these RPA components serve different functions. The tree canopy reduces the erosive effects of rain; the roots of the vegetation consume or "take up" both nitrogen and phosphorus; the leaf and other vegetable "litter" convert toxic substances contained in lawn care products to a less toxic form; and finally, tree limbs and other larger vegetable debris serve to obstruct sediment particles from entering the adjacent water body. All of these components work together to significantly reduce the amount of pollutants entering nearby water bodies.

When an RPA is being restored either voluntarily or as directed through and enforcement proceeding, the goal is to come as close as possible to achieving the original function described above.

The Office of Water Quality has produced this manual to serve as a how-to guide for monitoring restored riparian buffers. Our mission is to protect, maintain and restore the chemical, physical and biological integrity of Chesterfield County's waters. This mission furthers one of the county's strategic goals: To Be Responsible Protectors of the Environment. For more information, call (804) 748-1035.

*Providing a **FIRST CHOICE** community through excellence in public service*

Funding for this project was provided by the Chesapeake Bay Small Watershed Grant Program and the National Fish & Wildlife Foundation.

Why Monitor?

Thank you for participating in the Chesterfield County Citizen Riparian Buffer Monitoring Project. Planting riparian buffers is a great way to improve water quality, but planting is just the first step. To ensure a successful restoration, the area should be monitored for 3 – 5 years. The newly planted trees and shrubs compete with weeds, invasive species, deer and rodents in their early years. Monitoring the buffer during this time plays an essential role in the restoration process.

By monitoring a buffer, you will help us not only collect valuable data on the buffer, but help guide future planting projects. We hope that by monitoring and maintaining the restored buffers in the county, they will grow into fully functioning riparian buffers.

For more information on the importance and proper establishment of riparian buffers, please see the companion guide, "Chesterfield County Resource Protection Area Restoration Guide".

Supplies & Steps

Riparian Buffer Monitoring Steps:

- Attend training session
- Monitor buffer twice a year
- Submit data & photos to Office of Water Quality
- Help organize maintenance day
- Help recruit volunteers

Getting Started

Riparian buffer monitoring is easy and requires only two site visits a year. The Chesterfield County Office of Water Quality will train you before your first monitoring experience. This monitoring is primarily a visual assessment of the riparian buffer and will track the progress of the site including tree survival and growth.

Step 1. Schedule Your Monitoring Event

Each monitoring group will be different – you may be a family, scout group or even an individual. It is up to you to communicate with your group and set a time to visit the buffer. Once a time is selected, contact the Chesterfield County Office of Water Quality to schedule your event and arrange for checkout of the Riparian Monitoring Kit & Project File. Supplies in your kit will include:

- Project Notebook
- Field Guides
- Clip Boards
- Hand Clicker
- Compass & Tape
- Camera

The site should be visited twice a year. The first visit should be after leaves appear on the trees in late spring to early summer (June). The second visit should take place in late summer (August) to monitor weeds & other invasive plants. You can also monitor after a large storm or other weather event to look for signs of flooding or other damage.

Project Notebook

The Project Notebook is an important component in riparian buffer monitoring. In it you will find maps, planting plans, previous data sheets and photos of the site. This will help you during each session to recall the status of the buffer from previous visits.

Step 2. Become Familiar with Safety Procedures

One of the most critical considerations is the safety of our volunteers. All volunteers should become familiar with the safety procedures listed below and ask any questions or make comments as necessary. The safety procedures should be carried while in the field. Safety precautions can never be overemphasized.

The following are some basic common sense safety rules.

- Always monitor with at least one partner. Always let someone else know where you are, when you intend to return, and what to do if you don't come back at the appointed time.
- Develop a safety plan. Carry a cell phone into the field with you if possible or at least know the location of the nearest phone to you. Locate the nearest medical center and write down directions on how to get between the center and your site(s) so that you can direct emergency personnel.
- Have a first aid kit handy (see below). Know any important medical conditions of team members (e.g. heart conditions or allergies). It is ideal if at least one team member has basic first aid/CPR training.

First Aid Kit

The most basic first aid kit should contain the following items:

- A first aid manual outlining diagnoses and treatment procedures.
- Telephone numbers of emergency personnel (police, fire and EMS).
- Several adhesive bandages for minor cuts.
- Antibacterial or alcohol wipes.
- First aid crème or ointment.
- Several gauze pads 3 or 4 inches square for large cuts.
- A 2-inch roll of gauze bandage for large cuts.
- A triangular bandage for large wounds.
- Acetaminophen for relieving pain and reducing fever.
- A needle for removing splinters.
- If a volunteer is sensitive to bee stings, include their doctor-prescribed antihistamine.

- Listen to weather reports. Never go monitoring if severe weather is predicted or if a storm occurs while at the site.
- If you drive, park in a safe location. Secure your wallet and keys in a safe place.
- Never cross private property without the permission of the landowner.
- Be wary of wild animals, biting insects, and snakes. Also watch for poison ivy, oak, sumac and other types of vegetation in your area that may cause rashes and irritation.
- Check for ticks during and after monitoring.
- Stay hydrated.
- Never drink the water from the stream or lake adjacent to your site. Assume it is unsafe to drink and bring your own water from home. After monitoring, wash your hands with antibacterial soap.
- Do not monitor if the stream or lake is posted as unsafe for body contact. If the water appears to be severely polluted, contact the county's project coordinator.
- **If at any time you feel uncomfortable about the condition of the lake or your surroundings, stop monitoring and leave the site at once. Your safety is more important than the data!**

Step 3. Monitoring Procedures at the Riparian Buffer

General Observations

Once you arrive on site, you will make some general observations on Form A. Fill out the top portion of Form A. If you are unsure of the watershed or water body name, this can be found in your Project Notebook. Be sure to list all the volunteers present and the total number of hours (including your travel time to and from the site). ***You will complete the remainder of this form at the end of the monitoring event.*** Now look at the site map and orient yourself to the area.

Tree Inventory

You will be performing a 100% survey of the plants. With a small group, begin to inventory the trees. It is a good idea to use the map and start at one corner of the project. If the trees have tubes around them, you can use a marker to make a small marking to indicate the tree was inventoried. Simply visit each tree and fill out Form B.

Components of Form B

Tree #	Assign each tree a number.
Species	Try to identify each species. If you are unable to do this, please use "?"
Condition	Fill in with a "1" if the tree appears to be healthy & free to grow or a "2" if the tree is damaged or impaired in any way.
Height	Use the tape measure to measure the height of each tree.
Shelter	Does this tree have a shelter?
Mat	Does this tree have a mat?
Type of stock	Was it bare root or balled & burlap? (found in notebook)

Percent Survival

After performing the 100% survey, you will calculate percent survival. Add the total number of trees that are alive and divide by the number of trees planted (this number will be on the first page of your project file). Take this number and multiply by 100. Make sure to also write this number on Form A (general observations).

Photo Documentation

Photo Documentation is an important component of riparian buffer monitoring. It provides a visual record to support the rest of your data. It is helps compare the site to other sites of similar ages and conditions. There are two types of photos to be taken on-site: photo points and spot photos.

Photo Points – These are photographs that are taken from specific locations and angles at each monitoring session. These photos will help track tree growth and other changes at the site. These locations will be marked on your map

Spot Photos – These are photos that capture a specific item or event at the site. Examples of this type of photo include changes to the site such as tree damage, erosion, and invasive species.

Form C is provided for Photo Documentation. Make sure to label each of the photos you take. If you are taking digital photos, please ensure the file name matches the label on the form.

Example of Photo Point: site from bridge

Example of Spot Photo: insect damage on leaf

Maintenance

Now that you have completed the tree inventory, perform light maintenance. Pull any weeds that are competing with the tree, make sure the mat & tube are secure. Note any maintenance needs that cannot be performed at this time but should be addressed at a later date.

Site Issues

Now that you have completed Form B and taken photos, go back to Form A. Fill out the section on Site Issues, be sure to check the box if the issue exists and make comments about the issue. Site issues could include vandalism, excessive weed growth or other concerns.

Step 4. Return Riparian Monitoring Kit, Data Forms and Photos

After you finish the site visit, complete the data forms. Return the data forms, Riparian Buffer Monitoring Kit and photos to the Office of Water Quality. If you noticed any major maintenance needs, please let the staff know and schedule a time to do this.

Form A

Chesterfield County
Citizen Riparian Buffer Monitoring

General Observations

Project Name:_____ Project Number:_____

Watershed:_____ Stream/Water body:_____

Monitor name(s):_____

Number of volunteers:_____ Hours:_____ Total Volunteer Hours:_____

Date:_____Time:_____ Weather:_____

Site Issues:
Please complete section at the end of the site visit

Issue	**Yes**	**Comments**
Wildlife Damage	☐	
Livestock Damage	☐	
Insect Damage	☐	
Disease	☐	
Invasive species	☐	
Erosion	☐	
Vandalism	☐	
Damage to shelter/mat	☐	
Flooding	☐	
Drought Mortality	☐	
Mowing Scars	☐	
Other	☐	

Percent Survival:
(From sheet B)

Trees	%
Shrubs	%
Herbaceous	%

Notes:

Form B

Chesterfield County
Citizen Riparian Buffer Monitoring

Seedling Inventory

Project Name: _____ Project Number:_____ Date:_____

Inventory Type: ☐100% Survey

Tree #	Species	Alive? (Yes/No)	Condition (1 or 2)*	Height (Inches)	Shelter? (Yes/No)	Mat? (Yes/No)	Type of Stock	Comments

*1 = Healthy & free to grow
2 = Damaged or impaired

Percent Survival (100% survey only)
Total Live Trees Counted = _____/_____ installed X 100 = _____

Form C

Chesterfield County
Citizen Riparian Buffer Monitoring

Photo Documentation

Project Name: _____ Project Number:_____Date:_____

Photographer:_____ Format: ☐Digital ☐Film

Photo Points

Exposure #	Marked on Diagram? (Yes/No)	Direction	Description

Spot Photos

Exposure #	Marked on Diagram? (Yes/No)	Direction	Description

Notes

Bibliography & References

Adopt-A-Buffer Toolkit: Monitoring and Maintaining Restoration Projects, September 2003. Delaware Riverkeeper Network

Buffer Maintenance and Monitoring, September 2005. Alliance for the Chesapeake Bay. www.acb-online.org

Community Forest Buffer Guide, Chesapeake Bay Foundation.

Monitor Matters, September 2005, www.watersheds.org

Photo Procedure, September 2005, Canaan Valley Institute, www.canaanvi.org

Riparian Forest Buffer Design and Maintenance, June 2005. Maryland Department of Natural Resources, Forest Service.

For more information contact:

Chesterfield County Office of Water Quality
(804) 748-1035
http://www.chesterfield.gov/communitydevelopment/waterquality/

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